

We claim:

1. A method of treatment of behavioral disorders in a patient in need of such treatment, said method comprising the step of administering a compound
5 selected from the group consisting of clavulanic acid, pharmaceutically acceptable salts thereof, and active ester forms thereof that are hydrolyzed *in vivo* to clavulanic acid to said patient in an amount effective to provide a concentration of clavulanic acid in the brain of said patient sufficient to modify patient behavior.
2. A method of enhancing cognitive function in a patient suffering
10 from a condition characterized by impaired cognitive function, said method comprising the step of administering to said patient an effective amount of an active compound selected from the group consisting of clavulanic acid, pharmaceutically acceptable salts thereof, and active ester forms thereof that are hydrolyzed *in vivo* to clavulanic acid, to provide a cognition enhancing concentration of clavulanic acid in
15 the brain of said patient..
3. The method of claim 2 wherein the patient is a human patient suffering from dementia or amnesia.
4. The method of claim 2 wherein the patient is a human patient suffering from Alzheimer's Disease.
- 20 5. The method of claim 2 further comprising the step of administering an effective amount of a P-glycoprotein efflux pump inhibitor.
6. The method of claim 2 wherein the compound is administered in combination with an effective amount of a P-glycoprotein efflux pump inhibitor.
7. A method of treating a human patient afflicted with a condition,
25 or having a medical history predictive of the development of a condition characterized at least in part by abnormal extracellular glutamate concentration in the brain or other nervous tissue, said method comprising the step of administering to said patient a composition comprising a neurologically effective amount of compound selected from the group consisting of clavulanic acid, pharmaceutically acceptable salts
30 thereof, and active ester forms thereof that are hydrolyzed *in vivo* to clavulanic acid in neurologically effective quantities.
8. The method of claims 7 wherein the condition is selected from the group consisting of ischemia, epilepsy, hypoglycemia, Huntington's disease,

Alzheimer's disease, Parkinson's disease, Amyotrophic Lateral Sclerosis (ALS), chronic pain, and nervous tissue trauma.

9. The method of claim 7 wherein the patient condition is nervous tissue ischemia resulting from a temporary interruption of blood flow to said tissue.

5 10. A method of treating prostate disease selected from prostate cancer or benign prostatic hyperplasia in a human patient, said method comprising the step of administering to said patient a composition comprising a compound selected from the group consisting of clavulanic acid, pharmaceutically acceptable salts, and ester forms thereof that are hydrolyzed *in vivo* to clavulanic acid, wherein said
10 compound is administered in an amount effective to retard the progress of the disease or to reduce the symptoms of the disease.

11. A method for treatment of cognitive and behavioral disorders in a human patient in need of said treatment, said method comprising the step of administering to said patient a compound selected from the group consisting
15 of clavulanic acid, a salt, and an active ester form thereof that are hydrolyzed *in vivo* to clavulanic acid, in an amount effective to modulate neurogenic carboxy peptidase or transpeptidase activity in the brain.

12. A pharmaceutical formulation in unit dosage form effective for treatment of behavioral and cognitive disorders in a human patient in need thereof,
20 said formulation comprising a compound selected from the group consisting of clavulanic acid, pharmaceutically acceptable salts, and active ester forms thereof that are hydrolyzed *in vivo* to clavulanic acid, and a pharmaceutically acceptable carrier therefor, the amount of said compound in said unit dosage being effective to provide a concentration of clavulanic acid in the brain sufficient to modulate cognitive or
25 behavioral performance of said patient, said unit dosage form being without concomitant effective antibacterial activity in said patient.

13. The pharmaceutical formulation of claim 12 further comprising an effective amount of a P-glycoprotein efflux pump inhibitor.

14. The pharmaceutical formulation of claim 12 wherein the
30 formulation is an oral dosage form.

15. The pharmaceutical formulation of claim 12 wherein the formulation is a parenteral dosage form.

16. The pharmaceutical formulation of claim 12 wherein the

formulation is a prolonged release dosage form.

17. A method for treating a patient afflicted with or disposed to develop a disease characterized by abnormally elevated glutamate concentrations in neuronal tissue or elevated NAALADase levels in prostate tissue, said method
- 5 comprising the step of administering to said patient clavulanic acid or a pharmaceutically acceptable salt or ester form thereof that is hydrolyzed *in vivo* to clavulanic acid.